

## **Oasis on Enceladus?**

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Enceladus, one of the many moons of Saturn was overlooked by astronomers until the first data and photographs taken by the Cassini - Huygens space mission arrived. Surprised scientists discovered an area of active geology on Enceladus' southern hemisphere, where fractures in its icy shell eject plumes of material into space. When Cassini's instrumentation sampled those plumes, sodium, potassium rich water and ice grains were detected, along with silica and complex organic chemistry. Suggesting that the moon interior harbours an energy source, powerful enough to melt ice and to heat up water, sustaining complex chemical reactions between its rocky core and ocean and to transport chemically enriched liquid upwards. Based on data, it has been proposed that the main energy source of Enceladus is independent from solar radiation and originates internally from the deformation of its rocky core. The resulting heating from friction, is generated by Saturn's gravitational pull. This energy sustains a subterranean global ocean and hydrothermal activity which drives the chemical reactions. This resembles Earth's oceanic thermal vents, where life is sustained without solar energy. In this context Enceladus could be a habitable ocean world perhaps even harbouring life. These possibilities advocate for humanity to "return" to this promising moon, with upgraded and more sensitive instrumentation, tackling the question of habitability and the possibility of extra-terrestrial life. This document proposes sending a probe with instrumentation, more sensitive than before, to conduct a more accurate analysis of Enceladus' features and expand our knowledge on solar system formation and habitability.